

<p style="text-align: center;">NATIONAL AERONAUTICS AND SPACE ADMINISTRATION RESEARCH AND TECHNOLOGY RESUME</p>
<p>TITLE</p> <p style="text-align: center;">Imaging and Spectroscopy of Comet P/Halley</p>
<p>PERFORMING ORGANIZATION</p> <p style="text-align: center;">Atmospheric and Environmental Research, Inc. 840 Memorial Drive, Cambridge, MA 02139</p>
<p>INVESTIGATOR'S NAME</p> <p style="text-align: center;">Michael R. Combi</p>
<p>DESCRIPTION (a. Brief statement on strategy of investigation; b. Progress and accomplishments of prior year; c. What will be accomplished this year, as well as how and why; and d. Summary bibliography)</p> <p>a. The goals of this investigation are the analysis of a large set of high-resolution echelle/reticon spectra, and the reduction and analysis of a set of IAU narrow-band-filtered CCD images of comet Halley taken during the pre-perihelion period at Oak Ridge Observatory (CFA/SAO) by Dr. R. E. McCrosky. The scientific objectives associated with these goals are the determination of the spatial distributions of several important radicals, atoms and ions in the coma. These include C_2, CN, C_3, H_2O^+ and CO^+ from the image data and the $O(^1D)$ to NH_2 ratio from the spectral data. The analysis of the neutral species distributions with our Monte Carlo models, will aid in the understanding of their production and decay mechanisms as well as serve as an important indicator of the physical conditions in the inner coma. The spatial distributions of the ions will serve as a guide to constrain the complex models necessary for understanding the interaction of the solar wind and the cometary ions.</p> <p>b. Work during this past year has been devoted largely to the reduction of the standard star photometry for the CCD image data set, as well as the re-flat-fielding of a number of the comet images. We are pleased to report that despite a number of setbacks and the small effort devoted to this work (2 1/2 months for the PI and a generous share of completely unsupported time by Dr. McCrosky) that this portion of the work has been successfully completed.</p> <p>c. The goals for the upcoming final year of this project (under a new project number) are to complete the calibration of the CCD image data for inclusion in the IHW archive, to analyze a select portion of the neutral radical images with our Monte Carlo models, and to present the results of the 6300/ region spectra as a guide to low-resolution spectral observers in order to yield the unambiguous separation of the contributions of cometary $O(^1D)$, airglow $O(^1D)$, and the numerous NH_2 lines in that region of the spectrum.</p> <p>d. CCD Images and High Resolution Spectra of Comet P/Halley, M.R. Combi and R.E. McCrosky, 1986, ESA SP-250, 393. CCD Imaging and High Resolution Spectroscopy of Comet P/Halley, M.R. Combi and R.E. McCrosky, 1986, Bull. AAS. 18, 825.</p>

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